REMARKS

The present Amendment amends claims 1-13 and 16 and leaves claims 15 and 20-24 unchanged. Therefore, the present application has pending claims 1-13, 15, 16 and 20-24.

Claims 8, 12 and 13 stand objected to due to informalities noted by the Examiner in paragraph 3 of the Office Action. Amendments were made to claims 8, 12 and 13 to correct the informalities noted by the Examiner. Therefore, this objection is overcome and should be withdrawn.

Claims 1-24 stand rejected under 35 USC §103(a) as being unpatentable over Hirose (U.S. Patent Application Publication No. 2001/0049825) in view of Funaya (U.S. Patent No. 6,263,393); claims 8, 22 and 23 stand rejected under 35 USC §103(a) as being unpatentable over Hirose, Funaya and further in view of Tsao (U.S. Patent No. 6,862,274); and claim 16 stands rejected under 35 USC §103(a) as being unpatentable over Hirose in view of Yoshizawa (U.S. Patent No. 6,944,169). As per the December 5, 2005 Amendment, claims 14 and 17-19 were canceled. Therefore, the above 35 USC §103(a) rejection of claims 14 and 17-19 is rendered moot since these claims were already canceled.

These rejections with respect to the remaining claims 1-13, 15, 16 and 20-24 are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in 1-13, 15, 16 and 20-24 are not taught or suggested by Hirose, Funaya, Tsao and Yoshizawa whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to the claims to more clearly describe features of the present invention as recited in the claims. Particularly, amendments were made to the claims to recite that the present invention is directed to an address translator, a method of processing a message including a first portion and a second portion and a server device operative in cooperation with the address translator in a communication network.

The address translator according to the present invention connects a network A conforming to an addressing system P to a network B conforming to an addressing system Q.

According to the present invention the address translator includes an address translation function for translating an address conforming to the addressing system P to an address conforming to the addressing system Q, or vice versa and a detection function for detecting a communication conforming to a particular protocol based on at least one of information on a destination and information on a port contained in a header of communication data.

Further, according to the present invention the address translator translates, by the address translation function, an address of the communication data to a Layer 3 address corresponding to Layer 3 of the Open System Interconnection (OSI) model.

Still further, according to the present invention, when the address translator detects a communication conforming to the particular protocol, the address translator creates translation information including a correspondence relationship between addresses in the addressing system P and addresses in the addressing system Q for translating, by the address translation function,

an address of the communication data to a higher Layer address corresponding to a Layer higher than Layer 3 of the OSI model.

Thus, according to the present invention the address translator not only translates the Layer 3 address between protocols P and Q but also detects data in conformity with a specific protocol based on the destination information and the port information. Upon such detection the address translator creates translation information for translating the address on a Layer equal to or higher than Layer 3 of the OSI model for the detected data between protocols P and Q. These features of the present invention provide such a process that can efficiently detect whether data whose address on a Layer equal to or higher than Layer 3 should be translated and efficiently create the address translation information so as to conduct such translation.

It should be noted that in the OSI model, Internet Protocol (IP) corresponds to the network layer which is Layer 3, and the User Data Protocol (UDP) and Transmission Control Protocol (TCP) correspond to the transport layer which is Layer 4. Session Initiation Protocol (SIP) makes use of UDP and TCP and as such is conducted on Layer 4 which is higher in the OSI model relative to Layer 3. Attached for the Examiner's reference are pages from the Webopedia website defining and graphically illustrating the OSI model. As is described above, the present invention when a certain condition occurs uses SIP which is implemented on Layer 4 rather than IP which is implemented on Layer 3. The Examiner's attention is directed to the attached pages to gain a proper understanding of the OSI model and the context to which the present invention is directed.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references whether said references are taken individually or in combination with each other. Particularly, the above described features of the present invention are not taught or suggested by Hirose, Funaya, Tsao or Yoshizawa whether said references are taken individually or in combination with each other as suggested by the Examiner.

Hirose teaches a network device which is connectable to a network for use in directing data. In Hirose, the network device executes a receiving process by receiving data having a physical address indicating a destination of the data, comparing the physical address of the received data which registers physical addresses, completing the receiving process when the physical address of the received data matched with one of the registered physical addresses and canceling the receiving process. Further, Hirose teaches that the network device executes a transmission process by detecting a destination of data to be transmitted, selecting one of the registered physical addresses according to the detected destination of the data to be transmitted and attaching the selected physical address to the data thereby indicating an origin of the data.

Hirose teaches specifically the translation of a Media Access Control (MAC) address which is a unique identifier of a network device as implemented on Layer 2 of the OSI model. Thus, Hirose does not teach or suggest the translation of a Layer 3 address nor translation of a layer address of Layer higher than Layer 3 as in the present invention as recited in the claims.

Thus, Hirose fails to teach or suggest an address translating function for translating conforming to the addressing system P to an address conforming to the addressing system Q or vice versa and a detecting function for detecting a communication conforming to a particular protocol based on at least one of information on a destination and information on a port contained in a header of communication data as recited in the claims.

Further, Hirose fails to teach or suggest that the address translator translates, by the address translation function, an address of the communication data to a Layer 3 address corresponding to Layer 3 of the OSI model as recited in the claims.

Still further, Hirose fails to teach or suggest that, when the address translator detects a communication conforming to the particular protocol, the address translator creates translation information including a correspondence relationship between addresses in the addressing system P and addresses in the addressing system Q for translating, by the address translation function, an address of the communication data to a higher Layer address corresponding to a Layer higher than Layer 3 of the OSI model as recited in the claims.

The above described deficiencies of Hirose are not supplied by any of the other references of record. Particularly, the above described deficiencies of Hirose are not supplied by Funaya, Tsao or Yoshizawa whether said references are taken individually or in combination with Hirose as suggested by the Examiner in the Office Action. Therefore, the above described features of the present invention as now more clearly recited in the claims are not

taught or suggested by Hirose whether taken individually or in combination with any one or more of Funaya, Tsao or Yoshizawa.

In the Office Action the Examiner recognizes various deficiencies of Hirose. One of the deficiencies the Examiner recognizes is that Hirose does "explicitly disclose header of communication data and the first and second portions of the communication data". This deficiency of Hirose as recognized by the Examiner is alleged by the Examiner as being taught by Funaya.

Further, the Examiner recognizes that Hirose does not "explicitly teach the first portion is an IP header, said second portion is a payload including an SIP message". The Examiner alleges that this deficiency of Hirose is supplied by Funaya.

Still further, the Examiner recognizes that Hirose does not "explicitly disclose one of first protocol and second protocol is IPv4, and that the other is IPv6". The Examiner alleges that such deficiency is taught by Tsao.

Still further yet, the Examiner recognize that Hirose does not teach that an IP address is converted from a global IP address to a private IP address. The Examiner alleges that Yoshizawa supplies such deficiency.

Applicants submit that the disclosures of each of Funaya, Tsao and Yoshizawa being relied upon by the Examiner to supply the known deficiencies of Hirose is in error and in fact, such disclosures do not teach or suggest the matter being relied upon.

However, even if such matter is taught by Funaya, Tsao and Yoshizawa as alleged by the Examiner there is no teaching or suggestion in any of said references of the above described deficiencies of Hirose, particularly as it relates translating an address of the communication data to a

Layer 3 address corresponding to Layer 3 of the OSI model and detecting a communication conforming to a particular protocol and creating translation information for translating an address of the communication data to a higher Layer address corresponding to a Layer higher than Layer 3 of the OSI model as in the present invention as recited in the claims. As was pointed out above, the basic deficiencies of Hirose which apply to all of the other references, namely Funaya, Tsao and Yoshizawa are that Hirose is only directed to the translation of MAC addresses which are implemented on layer 2 of the OSI model not Layer 3 as in the present invention. There is absolutely no teaching or suggestion in Hirose or any of the other references namely, Funaya, Tsao and Yoshizawa of the translation of addresses on Layer 3 and the translation of addresses at a Layer higher than Layer 3 or Layer 4 as in the present invention as recited in the claims.

Thus, Funaya, Tsao and Yoshizawa, the same as Hirose, fail to teach or suggest <u>an address translating function for translating an address conforming to the addressing system P to an address conforming to the addressing system Q, or vice versa and a detecting function for detecting a communication conforming to a particular protocol based on at least one of information on a destination and information on a port contained in a header in communication data</u> as recited in the claims.

Further, Funaya, Tsao and Yoshizawa, the same as Hirose, fail to teach or suggest <u>that the address translator translates, by the address translation function, an address of the communication data to a Layer 3 address corresponding to Layer 3 of the OSI model</u> as recited in the claims.

Still further, Funaya, Tsao and Yoshizawa, the same as Hirose, fail to teach or suggest <u>that when the address translator detects a communication conforming to the particular protocol, the address translator creates translation information including a correspondence relationship between addresses in the addressing system P and addresses in the addressing system Q for translation an address of the communication data to a higher Layer address corresponding to a Layer higher than Layer 3 of the OSI model</u> as recited in the claims.

Therefore, since each of Hirose, Funaya, Tsao and Yoshizawa suffers from the same deficiencies relative to the features of the present invention as now more clearly recited in the claims, combining Hirose with any one or more of Funaya, Tsao and Yoshizawa, does not render obvious the claimed invention. Accordingly, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 1-24 as being unpatentable over Hirose in view of Funaya, reconsideration and withdrawal of the 35 USC §103(a) rejection of claims 8, 22 and 23 as being unpatentable over Hirose and Funaya in view of Tsao and reconsideration and withdrawal of the 35 USC §103(a) rejection of claim 16 as being unpatentable over Hirose in view of Yoshizawa are respectfully requested.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-13, 15, 16 and 20-24.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-13, 15, 16 and 20-24 are in condition for allowance.

Accordingly, early allowance of claims 1-13, 15, 16 and 20-24 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (500.41227X00).

Respectfully submitted,

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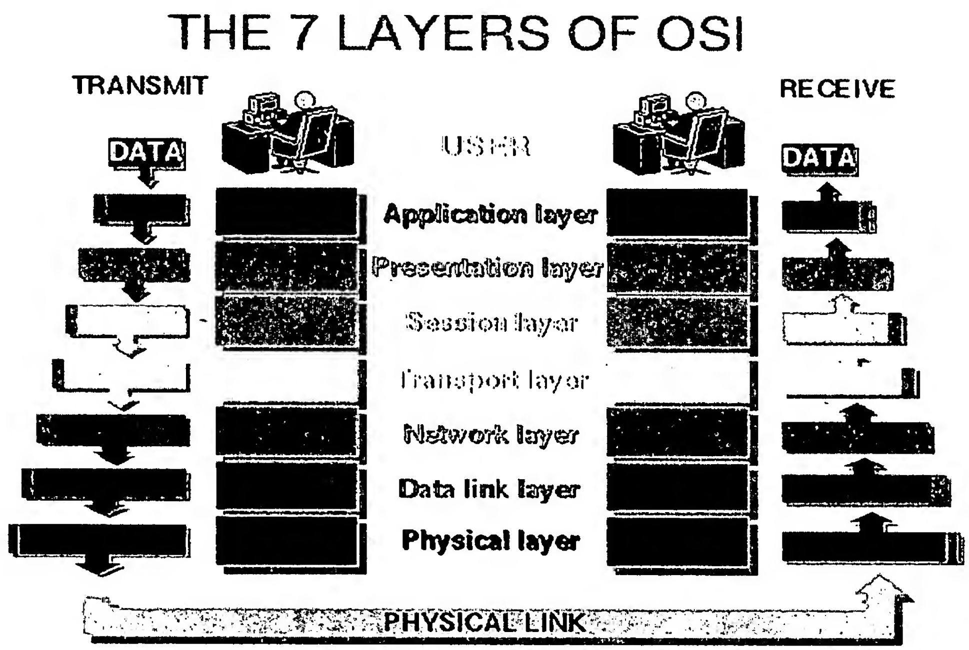
The 7 Layers of the OSI Model

The OSI, or Open System Interconnection, model defines a networking framework for implementing protocols in seven layers. Control is passed from one layer to the next, starting at the application layer in one station, proceeding to the bottom layer, over the channel to the next station and back up the hierarchy.

Application (Layer 7)	This layer supports application and end-user processes. Communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data syntax are identified. Everything at this layer is application-specific. This layer provides application services for file transfers, e-mail, and other network software services. Telnet and FTP are applications that exist entirely in the application level. Tiered application architectures are part of this layer.
Presentation (Layer 6)	This layer provides independence from differences in data representation (e.g., encryption) by translating from application to network format, and vice versa. The presentation layer works to transform data into the form that the application layer can accept. This layer formats and encrypts data to be sent across a network, providing freedom from compatibility problems. It is sometimes called the *syntax layer*.
Session (Layer 5)	This layer establishes, manages and terminates connections between applications. The session layer sets up, coordinates, and terminates conversations, exchanges, and dialogues between the applications at each end. It deals with session and connection coordination.
Transport (Layer 4)	This layer provides transparent transfer of data between end systems, or hosts, and is responsible for end-to-end error recovery and flow control. It ensures complete data transfer.
Network (Layer 3)	This layer provides switching and routing technologies, creating logical paths, known as virtual circuits, for transmitting data from node to node. Routing and forwarding are functions of this layer, as well as addressing, internetworking, error handling, congestion control and packet sequencing.
Data Link (Layer 2)	At this layer, data packets are encoded and decoded into bits. It furnishes transmission protocol knowledge and management and handles errors in the physical layer, flow control and frame synchronization. The data link layer is divided into two sublayers: The Media Access Control (MAC) layer and the Logical Link Control (LLC) layer. The MAC sublayer controls how a computer on the network gains access to the data and permission to transmit it. The LLC layer controls frame synchronization, flow control and error checking.
Physical (Layer 1)	This layer conveys the bit stream - electrical impulse, light or radio signal -- through the network at the electrical and mechanical level. It provides the hardware means of sending and receiving data on a carrier, including defining cables, cards and physical aspects. Fast Ethernet, RS232, and ATM are protocols with physical layer components.



This graphic is taken from The Abdus

OSI model

From Wikipedia, the free encyclopedia

OSI Model
7 Application layer
6 Presentation layer
5 Session layer
4 Transport layer
3 Network layer
2 Data link layer ▪ LLC sublayer ▪ MAC sublayer
1 Physical layer

The **Open Systems Interconnection Basic Reference Model** (*OSI Reference Model* or *OSI Model* for short) is a layered, abstract description for communications and computer network protocol design, developed as part of Open Systems Interconnection (OSI) initiative. It is also called the **OSI seven layer model**.

Contents

History

In 1977, the International Organization for Standardization (ISO), began to develop its OSI networking suite. OSI has two major components: an abstract model of networking (the Basic Reference Model, or seven-layer model), and a set of concrete protocols. The standard documents that describe OSI are for sale and not currently available online.

Parts of OSI have influenced Internet protocol development, but none more than the abstract model itself, documented in ISO 7498 and its various addenda. In this model, a networking system is divided into layers. Within each layer, one or more entities implement its functionality. Each entity interacts directly only with the layer immediately beneath it, and provides facilities for use by the layer above it. Protocols enable an entity in one host to interact with a corresponding entity at the same layer in a remote host.

Description of OSI layers

Layer 7: Application layer

OSI Model			
	Data unit	**Layer**	**Function**
Host layers	Data	Application	Network process to application
		Presentation	Data representation and encryption
		Session	Interhost communication
	Segments	Transport	End-to-end connections and reliability (TCP)
Media layers	Packets	Network	Path determination and logical addressing (IP)
	Frames	Data link	Physical addressing (MAC & LLC)
	Bits	Physical	Media, signal and binary transmission

The application layer is the seventh level of the seven-layer OSI model. It interfaces directly to and performs common application services for the application processes; it also issues requests to the presentation layer.

The common application services sublayer provides functional elements including the Remote Operations Service Element (comparable to Internet Remote Procedure

Call), Association Control, and Transaction
Processing (according to the ACID requirements).

Above the common application service sublayer are functions meaningful to user application programs, such as messaging (X.400), directory (X.500), file transfer (FTAM), virtual terminal (VTAM), and batch job manipulation (JTAM).

Internet protocols are not as rigorously architected as the OSI model, but a common version of the TCP/IP protocol splits it into four layers. The Internet Application Layer includes the OSI Application Layer, Presentation Layer, and most of the Session Layer. Its End-to-End Layer includes the graceful close function of the OSI Session Layer as well as the Transport Layer. Its Internetwork Layer is equivalent to the OSI Network Layer, while its Interface layer includes the OSI Data Link and Physical Layers. These comparisons are based on the original seven-layer protocol model as defined in ISO 7498, rather than refinements in such things as the Internal Organization of the Network Layer document.

Layer 6: Presentation layer

The Presentation layer transforms the data to provide a standard interface for the Application layer. MIME encoding, data encryption and similar manipulation of the presentation are done at this layer to present the data as a service or protocol developer sees fit. Examples of this layer are converting an EBCDIC-coded text file to an ASCII-coded file, or serializing objects and other data structures into and out of XML.

Layer 5: Session layer

The Session layer controls the dialogues/connections (sessions) between computers. It establishes, manages and terminates the connections between the local and remote application. It provides for either full-duplex or half-duplex operation, and establishes checkpointing, adjournment, termination, and restart procedures. The OSI model made this layer responsible for "graceful close" of sessions, which is a property of TCP, and also for session checkpointing and recovery, which is not usually used in the Internet protocols suite.

Layer 4: Transport layer

The Transport layer provides transparent transfer of data between end users, thus relieving the upper layers from any concern while providing reliable data transfer. The transport layer controls the reliability of a given link through flow control, segmentation/desegmentation, and error control. Some protocols are state and connection oriented. This means that the transport layer can keep track of the segments and retransmit those that fail. The best known example of a layer 4 protocol is the Transmission Control Protocol (TCP). The transport layer is the layer that converts messages into TCP segments or User Datagram Protocol (UDP), Stream Control Transmission Protocol (SCTP), etc. Perhaps an easy way to visualize the Transport Layer is to compare it with a Post Office, which deals with the dispatch and classification of mail and parcels sent. Do remember, however, that a post office manages the outer envelope of mail. Higher layers may have the equivalent of double envelopes, such as cryptographic Presentation services that can be read by the addressee only. Roughly speaking, tunneling protocols operate at the transport layer, such as carrying non-IP protocols such as IBM SNA or Novell IPX over an IP network, or end-to-end encryption with IPSec. While GRE might seem to be a network layer protocol, if the encapsulation of the payload takes place only at endpoint, GRE becomes closer to a transport protocol that uses IP headers but contains complete frames or packets to deliver to an endpoint. L2TP carries PPP frames inside transport packets.

Layer 3: Network layer

The Network layer provides the functional and procedural means of transferring variable length data sequences from a source to a destination via one or more networks while maintaining the quality of service requested by the Transport layer. The Network layer performs network routing functions, and might also perform fragmentation and reassembly, and report delivery errors. Routers operate at this layer—sending data throughout the extended network and making the Internet possible. This is a logical addressing scheme – values are chosen by the network engineer. The addressing

scheme is hierarchical. The best known example of a layer 3 protocol is the Internet Protocol (IP). Perhaps it's easier to visualize this layer as managing the sequence of human carriers taking a letter from the sender to the local post office, trucks that carry sacks of mail to other post offices or airports, airplanes that carry airmail between major cities, trucks that distribute mail sacks in a city, and carriers that take a letter to its destinations. Think of fragmentation as splitting a large document into smaller envelopes for shipping, or, in the case of the network layer, splitting an application or transport record into packets.

Layer 2: Data Link layer

The Data Link layer provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical layer. The best known example of this is Ethernet. This layer manages the interaction of devices with a shared medium. Other examples of data link protocols are HDLC and ADCCP for point-to-point or packet-switched networks and Aloha for local area networks. On IEEE 802 local area networks, and some non-IEEE 802 networks such as FDDI, this layer may be split into a Media Access Control (MAC) layer and the IEEE 802.2 Logical Link Control (LLC) layer. It arranges bits from the physical layer into logical chunks of data, known as frames.

This is the layer at which the bridges and switches operate. Connectivity is provided only among locally attached network nodes forming layer 2 domains for unicast or broadcast forwarding. Other protocols may be imposed on the data frames to create tunnels and logically separated layer 2 forwarding domain.

Sliding window is a general protocol used with bit-oriented protocols. In this protocol, the transmitter maintains a variable, S, which denotes the sequence number of the next frame to be transmitted. Similarly, the receiver maintains a variable, R, which denotes the sequence number of the next frame it expects to receive. Both variables are restricted to a limited range of values (e.g., 0 through 7) by using modulo arithmetic (e.g., modulo 8).Read more Sliding window protocol

Layer 1: Physical layer

The Physical layer defines all the electrical and physical specifications for devices. In particular, it defines the relationship between a device and a physical medium. This includes the layout of pins, voltages, and cable specifications. Hubs, repeaters, network adapters and Host Bus Adapters (HBAs used in Storage Area Networks) are physical-layer devices. The major functions and services performed by the physical layer are:

- Establishment and termination of a connection to a communications medium.
- Participation in the process whereby the communication resources are effectively shared among multiple users. For example, contention resolution and flow control.
- Modulation, or conversion between the representation of digital data in user equipment and the corresponding signals transmitted over a communications channel. These are signals operating over the physical cabling (such as copper and fiber optic) or over a radio link.

Parallel SCSI buses operate in this layer. Various physical-layer Ethernet standards are also in this layer; Ethernet incorporates both this layer and the data-link layer. The same applies to other local-area networks, such as Token ring, FDDI, and IEEE 802.11, as well as personal area networks such as Bluetooth and IEEE 802.15.4.

Interfaces

In addition to standards for individual protocols in transmission, there are also interface standards for different layers to talk to the ones above or below (usually operating-system–specific). For example, Microsoft Windows' Winsock, and Unix's Berkeley sockets and System V Transport Layer Interface, are interfaces between applications (layers 5 and above) and the transport (layer 4). NDIS and ODI are interfaces between the media (layer 2) and the network protocol (layer 3).

Examples

Layer #	Layer Name	Misc. examples	TCP/IP suite	SS7	AppleTalk suite	OSI suite	IPX suite	SNA	UMTS
7	Application	NNTP, HL7, Modbus, SIP, SSI	DHCP, DNS, FTP, Gopher, HTTP, NFS, NTP, RTP, SMPP, SMTP, SNMP, Telnet	ISUP, INAP, MAP, TUP, TCAP	AFP	FTAM, X.400, X.500, DAP		APPC	
6	Presentation	TDI, ASCII, EBCDIC, MIDI, MPEG	MIME, XDR, SSL, TLS (Not a separate layer)		AFP	ISO 8823, X.226			
5	Session	Named Pipes, NetBIOS, SAP, SDP	Sockets. Session establishment in TCP. SIP. (Not a separate layer with standardized API.)		ASP, ADSP, ZIP, PAP	ISO 8327, X.225	NWLink	DLC?	
4	Transport	NetBEUI, nanoTCP, nanoUDP	TCP, UDP, SCTP		ATP, NBP, AEP, RTMP	TP0, TP1, TP2, TP3, TP4	SPX		
3	Network	NetBEUI, Q.931	IP, ICMP, IPsec, ARP, RIP, OSPF	MTP-3, SCCP	DDP	X.25 (PLP), CLNP	IPX		RRC (Radio Resource Control)
2	Data Link	802.3 (Ethernet), 802.11a/b/g/n MAC/LLC, 802.1Q (VLAN), token ring, FDDI, PPP, HDLC, Q.921, Frame Relay, ATM, Fibre Channel	PPP, SLIP, PPTP, L2TP	MTP-2	LocalTalk, TokenTalk, EtherTalk, AppleTalk Remote Access, PPP	X.25 (LAPB), Token Bus	IEEE 802.3 framing, Ethernet II framing	SDLC	RLC (Radio Link Control), MAC (Media Access Control), PDCP (Packet Data Convergence Protocol) and Broadcast/Multicast Control (BMC).
1	Physical	RS-232, V.35, V.34, I.430, I.431, T1, E1, 10BASE-T, 100BASE-TX, POTS, SONET, DSL,		MTP-1	RS-232, RS-422, STP, PhoneNet	X.25 (X.21bis, EIA/TIA-232, EIA/TIA-449, EIA-530, G.703)		Twinax	UMTS L1 (UMTS Physical Layer)

		802.11a/b/g/n PHY							

Humor

- The seven layer model is sometimes humorously extended to refer to non-technical issues or problems. A common joke is the **10 layer model**, with layers 8, 9, and 10 being the "user", "financial", and "political" layers, or the "money", "politics", and "religion" layers. Similarly, network technicians will sometimes refer to "layer-eight problems", meaning problems with an end user and not with the network.

See also

- TCP/IP model
- Internet protocol suite
- List of network protocols
- OSI protocols
- Node

External links

- ISO standard 7498-1:1994 (ZIP format)
- Cybertelecom — Layered Model of Regulation
- OSI Reference Model — The ISO Model of Architecture for Open Systems Interconnection PDF (776 KiB), Hubert Zimmermann, IEEE Transactions on Communications, vol. 28, no. 4, April 1980, pp. 425 - 432.
- Internetworking Basics

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Categories: CISSP | Network architecture | ISO standards | ITU-T recommendations | OSI protocols | Reference models

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